Name: Date:

Polynomial Factoring solution (version 2)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 2x + 14 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(2) \pm \sqrt{(2)^2 - 4(1)(14)}}{2(1)}$$

$$x = \frac{-(2) \pm \sqrt{4 - 56}}{2(1)}$$

$$x = \frac{-2 \pm \sqrt{-52}}{2}$$

$$x = \frac{-2 \pm \sqrt{-4 \cdot 13}}{2}$$

$$x = \frac{-2 \pm 2\sqrt{13}\, i}{2}$$

$$x = -1 \pm \sqrt{13}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-2 - 6i$ and $9 - 5i$ in standard form $(a + bi)$.**

Solution

$$(-2 - 6i) \cdot (9 - 5i)$$

$$-18 + 10i - 54i + 30i^2$$

$$-18 + 10i - 54i - 30$$

$$-18 - 30 + 10i - 54i$$

$$-48 - 44i$$

Polynomial Factoring solution (version 2)

3. **Write function $f(x) = x^3 + 11x^2 + 34x + 24$ in factored form. I'll give you a hint: one factor is $(x + 6)$.**

Solution

	1	11	34	24
-6		-6	-30	-24
	1	5	4	0

$$f(x) = (x + 6)(x^2 + 5x + 4)$$

$$f(x) = (x + 6)(x + 4)(x + 1)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x + 5)^2 \cdot (x + 1)^2 \cdot (x - 2) \cdot (x - 5)$$

Sketch a graph of polynomial $y = p(x)$.